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EXAMINER	
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ART UNIT	**PAPER NUMBER**
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SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/806,594	Applicant(s) MRZIGLOD ET AL.	
	Examiner Wilbert L. Starks, Jr.	Art Unit 2129	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *23 March 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 U.S.C. §101

1. 35 U.S.C. §101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

the invention as disclosed in claims 1-21 is directed to non-statutory subject matter.

2. None of the claims is limited to practical applications that indicate a specific practical utility for the claimed invention. Examiner finds that *In re Warmerdam*, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994) controls the 35 U.S.C. §101 issues on that point for reasons made clear by the Federal Circuit in *AT&T Corp. v. Excel Communications, Inc.*, 50 USPQ2d 1447 (Fed. Cir. 1999). Specifically, the Federal Circuit held that the act of:

> ...[T]aking several abstract ideas and manipulating them together adds nothing to the basic equation. *AT&T v. Excel* at 1453 quoting *In re Warmerdam*, 33 F.3d 1354, 1360 (Fed. Cir. 1994).

Examiner finds that Applicant's "training data" references are just such abstract ideas.

3. Examiner bases his position upon guidance provided by the Federal Circuit in *In re Warmerdam*, as interpreted by *AT&T v. Excel*. This set of precedents is within the same line of cases as the *Alappat-State Street Bank* decisions and is in complete

agreement with those decisions. *Warmerdam* is consistent with *State Street*'s holding that:

> Today we hold that *the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price*, constitutes a practical application of a mathematical algorithm, formula, or calculation because it produces 'a useful, concrete and tangible result" -- *a final share price momentarily fixed for recording purposes and even accepted and relied upon by regulatory authorities and in subsequent trades*. (emphasis added) *State Street Bank* at 1601.

4. True enough, that case later eliminated the "business method exception" in order to show that business methods were not per se nonstatutory, but the court clearly *did not* go so far as to make business methods *per se statutory*. A plain reading of the excerpt above shows that the Court was *very specific* in its definition of the new *practical application* that indicates a specific practical utility for the claimed invention. It would have been much easier for the court to say that "business methods were per se statutory" than it was to define the practical application in the case as "...the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price..."

5. The court was being very specific.

6. Additionally, the court was also careful to specify that the "useful, concrete and tangible result" it found was "a final share price momentarily fixed for recording purposes and even accepted and relied upon by regulatory authorities and in subsequent trades." (i.e. the trading activity is the further practical use of the real world

monetary data beyond the transformation in the computer – i.e., "post-processing activity".)

7. Applicant cites no such specific results to define a useful, concrete and tangible result. Neither does Applicant specify the associated practical application with the kind of specificity the Federal Circuit used.

8. Furthermore, in the case *In re Warmerdam*, the Federal Circuit held that:

> ...[T]he dispositive issue for assessing compliance with Section 101 in this case is whether the claim is for a process that goes beyond simply manipulating 'abstract ideas' or 'natural phenomena' ... As the Supreme Court has made clear, '[a]n idea of itself is not patentable, ... *taking several abstract ideas and manipulating them together adds nothing to the basic equation*. In re Warmerdam 31 USPQ2d at 1759 (emphasis added).

9. Since the Federal Circuit held in *Warmerdam* that this is the "dispositive issue" when it judged the usefulness, concreteness, and tangibility of the claim limitations in that case, Examiner in the present case views this holding as the dispositive issue for determining whether a claim is "useful, concrete, and tangible" in similar cases. Accordingly, the Examiner finds that Applicant manipulated a set of abstract "training data" to solve purely algorithmic problems in the abstract (i.e., what *kind* of "training data" are used? Heart rhythm data? Algebraic equations? Boolean logic problems? Fuzzy logic algorithms? Probabilistic word problems? Philosophical ideas? Even vague expressions, about which even reasonable persons could differ as to their meaning? Combinations thereof?) Clearly, a claim for manipulation of "training data" is provably even more abstract (and thereby less limited in practical application) than pure "mathematical algorithms" which the Supreme Court has held are per se nonstatutory – in fact, it *includes* the expression of nonstatutory mathematical algorithms.

10. Since the claims are not limited to exclude such abstractions, the broadest reasonable interpretation of the claim limitations includes such abstractions. Therefore, the claims are impermissibly abstract under 35 U.S.C. §101 doctrine.

11. Since *Warmerdam* is within the *Alappat-State Street Bank* line of cases, it takes the same view of "useful, concrete, and tangible" the Federal Circuit applied in *State Street Bank*. Therefore, under *State Street Bank*, this could not be a "useful, concrete and tangible result". There is only manipulation of abstract ideas.

12. The Federal Circuit validated the use of *Warmerdam* in its more recent *AT&T Corp. v. Excel Communications, Inc.* decision. The Court reminded us that:

> Finally, **the decision in In re Warmerdam**, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994) **is not to the contrary.** *** The court found that the claimed process did nothing more than manipulate basic mathematical constructs and concluded that '**taking several abstract ideas and manipulating them together adds nothing to the basic equation**'; hence, the court held that the claims were properly rejected under §101 ... Whether one agrees with the court's conclusion on the facts, the **holding** of the case is a straightforward application of the basic principle that mere laws of nature, natural phenomena, and abstract ideas are not within the categories of inventions or discoveries that may be patented under §101. (emphasis added) AT&T Corp. v. Excel Communications, Inc., 50 USPQ2d 1447, 1453 (Fed. Cir. 1999).

13. Remember that in *In re Warmerdam*, the Court said that this was the dispositive issue to be considered. In the *AT&T* decision cited above, the Court reaffirms that this is the issue for assessing the "useful, concrete, and tangible" nature of a set of claims under §101 doctrine. Accordingly, Examiner views the *Warmerdam* holding as the dispositive issue in this analogous case.

14. The fact that the invention is merely the manipulation of *abstract ideas* is clear. The data referred to by Applicant's idea of "training data" is simply an abstract construct that does not provide limitations in the claims to the transformation of real world data (such as monetary data or heart rhythm data) by some disclosed process. Consequently, the necessary conclusion under *AT&T, State Street* and *Warmerdam,* is straightforward and clear. The claims take several abstract ideas (i.e., "training data" in the abstract) and manipulate them together adding nothing to the basic equation. Claims 1-21 are, thereby, rejected under 35 U.S.C. §101.

Claim Rejections - 35 U.S.C. §112

The following is a quotation of the first paragraph of 35 U.S.C. §112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-21 are rejected under 35 U.S.C. §112, first paragraph because current case law (and accordingly, the MPEP) require such a rejection if a §101 rejection is given because when Applicant has not in fact disclosed the practical application for the invention, as a matter of law there is no way Applicant could have disclosed *how* to practice the *undisclosed* practical application. This is how the MPEP puts it:

> ("The how to use prong of section 112 **incorporates as a matter of law** the requirement of 35 U.S.C. §101 that the specification disclose as a matter of fact a practical utility for the invention.... <u>If the application fails as a matter of fact to satisfy 35 U.S.C. §101, then the application **also fails as a matter of law** to enable one of ordinary skill in the art to use the invention under 35 U.S.C. §112."</u>); In re Kirk, 376 F.2d 936, 942, 153 USPQ 48, 53 (CCPA 1967) ("Necessarily, compliance with §112 requires a description of how to use presently useful inventions, **otherwise an applicant would anomalously be required to teach how to use a useless invention.**") See, MPEP 2107.01(IV), quoting In re Kirk (emphasis added).

Examiner made a §101 utility rejection of the claims because they fail to indicate a specific practical utility (i.e., practical application) for the claimed invention. Therefore, claims 1-21 are rejected on this basis.

Claim Rejections - 35 U.S.C. §102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. §102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims, 1, 12, and 17 are rejected under 35 U.S.C. §102(b) as being anticipated by Neuneier et al. (U.S. Patent Number 6,282,529 B1; dated 28 AUG 2001; class 706; subclass 015). Specifically:

Claim 1

Claim 1's "determining a first training data record, wherein the training data have a particular accuracy;" is anticipated by Neuneier et al., col. 1, lines 31-56, where it recites:

> It is known to implement the generation of the artificial training vectors by infesting the **available training data vectors** of the training dataset with noise. In this context, it is known from document [1] to determine the training dataset with Gaussian noise having the average value 0 and a variance a that is set to the same value for all inputs of the neural network.
>
> It is known from document [4] to generate training data by introducing additional noise. It is thereby known to utilize what is referred to as the jackknife procedure. This method, however, exhibits a number of disadvantages.
>
> Indeed wherein a Gaussian noise with a variance that is set to the same value for all inputs of the neural network is employed for generating the additional training data vectors as statistical distribution that is used for generation, training data vectors are newly generated that contain no statement whatsoever about the system to be modelled. Further, the training data vectors contain no information whatsoever about the actual noise underlying the system. Although the training dataset is thus enlarged, this does not have to support the learning process since a permanently predetermined noise that has nothing to do with the actual system dynamics is employed for training the neural network. Over-training can then nonetheless arise.

Claim 1's "generating a plurality of second data training records by perturbing the first training data record with a random variable" is anticipated by Neuneier et al., col. 1, lines 31-56, where it recites:

> It is known to implement the generation of the artificial training vectors by infesting the available training data vectors of the training dataset with noise. In this context, it is known from document [1] to determine the training dataset with Gaussian noise having the average value 0 and a variance a that is set to the same value for all inputs of the neural network.
>
> It is known from document [4] to generate training data by introducing additional noise. It is thereby known to utilize what is referred to as the **jackknife procedure**. This method, however, exhibits a number of disadvantages.
>
> Indeed wherein a Gaussian noise with a variance that is set to the same value for all inputs of the neural network is employed for generating the additional training data vectors as statistical distribution that is used for generation, training data vectors are newly generated that contain no statement whatsoever about the system to be modelled. Further, the training data vectors contain no information whatsoever about the actual noise underlying the system. Although the training dataset is thus enlarged, this does not have to support the learning process since a permanently predetermined noise that has nothing to do with the actual system dynamics is employed for training the neural network. Over-training can then nonetheless arise.

Claim 1's "training each of the plurality of neural networks with one of the training data records." is anticipated by Neuneier et al., col. 1, lines 31-56, where it recites:

> It is known to implement the generation of the artificial training vectors by infesting the available training data vectors of the training dataset with noise. In this context, it is known from document [1] to determine the training dataset with Gaussian noise having the average value 0 and a variance a that is set to the same value for all inputs of the neural network.
>
> It is known from document [4] to generate training data by introducing additional noise. It is thereby known to **utilize** what is

> referred to as the jackknife procedure. This method, however, exhibits a number of disadvantages.
>
> Indeed wherein a Gaussian noise with a variance that is set to the same value for all inputs of the neural network is employed for generating the additional training data vectors as statistical distribution that is used for generation, training data vectors are newly generated that contain no statement whatsoever about the system to be modelled. Further, the training data vectors contain no information whatsoever about the actual noise underlying the system. Although the training dataset is thus enlarged, this does not have to support the learning process since a permanently predetermined noise that has nothing to do with the actual system dynamics is employed for training the neural network. Over-training can then nonetheless arise.

Claim 12

Claim 12's "determining a first training data record, wherein the training data have a particular accuracy; " is anticipated by Neuneier et al., col. 1, lines 31-56, where it recites:

> It is known to implement the generation of the artificial training vectors by infesting the **available training data vectors** of the training dataset with noise. In this context, it is known from document [1] to determine the training dataset with Gaussian noise having the average value 0 and a variance a that is set to the same value for all inputs of the neural network.
>
> It is known from document [4] to generate training data by introducing additional noise. It is thereby known to utilize what is referred to as the jackknife procedure. This method, however, exhibits a number of disadvantages.
>
> Indeed wherein a Gaussian noise with a variance that is set to the same value for all inputs of the neural network is employed for generating the additional training data vectors as statistical distribution that is used for generation, training data vectors are newly generated that contain no statement whatsoever about the system to be modelled. Further, the training data vectors contain no information whatsoever about the actual noise underlying the system. Although the training dataset is thus enlarged, this does not have to support the learning process since a permanently predetermined noise that has nothing to do

> with the actual system dynamics is employed for training the neural network. Over-training can then nonetheless arise.

Claim 12's "generating a plurality of second data training records by perturbing the first training data record with a random variable;" is anticipated by Neuneier et al., col. 1, lines 31-56, where it recites:

> <u>It is known to implement the generation of the artificial training vectors by infesting the available training data vectors of the training dataset with noise</u>. In this context, it is known from document [1] to determine the training dataset with Gaussian noise having the average value 0 and a variance a that is set to the same value for all inputs of the neural network.
>
> It is known from document [4] to generate training data by introducing additional noise. It is thereby known to utilize what is referred to as the jackknife procedure. This method, however, exhibits a number of disadvantages.
>
> Indeed wherein a Gaussian noise with a variance that is set to the same value for all inputs of the neural network is employed for generating the additional training data vectors as statistical distribution that is used for generation, training data vectors are newly generated that contain no statement whatsoever about the system to be modelled. Further, the training data vectors contain no information whatsoever about the actual noise underlying the system. Although the training dataset is thus enlarged, this does not have to support the learning process since a permanently predetermined noise that has nothing to do with the actual system dynamics is employed for training the neural network. Over-training can then nonetheless arise.

Claim 12's "training each of the plurality of neural networks with one of the training data records;" is anticipated by Neuneier et al., col. 1, lines 31-56, where it recites:

> It is known to implement the generation of the artificial training vectors by infesting the available training data vectors of the training dataset with noise. In this context, it is known from document [1] to

> determine the training dataset with Gaussian noise having the average value 0 and a variance a that is set to the same value for all inputs of the neural network.
>
> It is known from document [4] to generate training data by introducing additional noise. It is thereby known to **utilize** what is referred to as the jackknife procedure. This method, however, exhibits a number of disadvantages.
>
> Indeed wherein a Gaussian noise with a variance that is set to the same value for all inputs of the neural network is employed for generating the additional training data vectors as statistical distribution that is used for generation, training data vectors are newly generated that contain no statement whatsoever about the system to be modelled. Further, the training data vectors contain no information whatsoever about the actual noise underlying the system. Although the training dataset is thus enlarged, this does not have to support the learning process since a permanently predetermined noise that has nothing to do with the actual system dynamics is employed for training the neural network. Over-training can then nonetheless arise.

Claim 12's "determining a prognosis value based on an evaluation of the prognoses output by the plurality of neural networks." is anticipated by Neuneier et al., col. 4, lines 49-60, where it recites:

> This method can be especially advantageously employed in application situations wherein only a relatively slight number of training data vectors TDVI is available for training the neural network NN. As a result the training dataset TDM can be considerably artificially expanded into an expanded training dataset KTDM without falsifying the actual system dynamics since the statistical properties of the training dataset TDM are also contained in the artificial training data vectors KTDV. A typical application situation of the method lies in the **analysis of financial markets**, for example, **stock markets** or bond markets.

Claim 17

Claim 17's "a plurality of neural networks, at least some of which have been trained by means of perturbed training data records," is anticipated by Neuneier et al., col. 1, lines 31-56, where it recites:

> <u>It is known to implement the generation of the artificial training vectors by infesting the available training data vectors of the training dataset with noise</u>. In this context, it is known from document [1] to determine the training dataset with Gaussian noise having the average value 0 and a variance a that is set to the same value for all inputs of the neural network.
>
> It is known from document [4] to generate training data by introducing additional noise. It is thereby known to utilize what is referred to as the jackknife procedure. This method, however, exhibits a number of disadvantages.
>
> Indeed wherein a Gaussian noise with a variance that is set to the same value for all inputs of the neural network is employed for generating the additional training data vectors as statistical distribution that is used for generation, training data vectors are newly generated that contain no statement whatsoever about the system to be modelled. Further, the training data vectors contain no information whatsoever about the actual noise underlying the system. Although the training dataset is thus enlarged, this does not have to support the learning process since a permanently predetermined noise that has nothing to do with the actual system dynamics is employed for training the neural network. Over-training can then nonetheless arise.

Claim 17's "an input means for entering input data into the neural networks," is anticipated by Neuneier et al., Fig. 2, element "NN" has an input.

Claim 17's "an evaluating means for evaluating the prognoses output by the neural networks for determining a prognosis value." is anticipated by Neuneier et al., col. 4, lines 49-60, where it recites:

> This method can be especially advantageously employed in application situations wherein only a relatively slight number of training data vectors TDVI is available for training the neural network NN. As a result the training dataset TDM can be considerably artificially expanded into an expanded training dataset KTDM without falsifying the actual system dynamics since the statistical properties of the training dataset TDM are also contained in the artificial training data vectors KTDV. <u>A</u>

> <u>typical application situation of the method lies in the **analysis of financial markets**, for example, **stock markets** or bond markets.</u>

Conclusion

The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure. Specifically:

A. Skeirik; Richard D, (U.S. Patent Number 5,826,249 A; dated 20 OCT 1998; class 706; subclass 025) discloses a historical database training method for neural networks.

B. Bigus; Joseph Phillip (U.S. Patent Number 5,745,652 A; dated 28 APR 1998; class 706; subclass 014) discloses an adaptive resource allocation using neural networks.

C. Bigus; Joseph Phillip (U.S. Patent Number 5,704,012 A; dated 30 DEC 1997; class 706; subclass 019) discloses an adaptive resource allocation using neural networks.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Wilbert L. Starks, Jr. whose telephone number is (571) 272-3691.

Alternatively, inquiries may be directed to the following:

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21 January 2007